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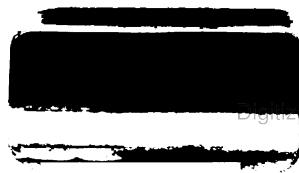
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INDUSTRIAL EDUCATION FOR THE CITY OF HAMILTON OHIO

by

WIMFRED Q. BROWN

A THESIS SUBMITTED FOR THE DEGREE OF MASTER OF ARTS

UNIVERSITY OF WISCONSIN

1912

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FOREWORD.

I desire to express publicly my gratitude to many who have aided me in the preparation of this thesis; especially to Dr. Elliott of the University of Wisconsin under whose direction the work was planned and whose counsel has been frequently sought in its completion; to Supt. Joyce and Principal Lake of the Hamilton Public Schools who have put at my service the reports and statistics of the city school system. The uniform courtesy shown me by business men and workingmen in my attempt to get a complete view of the industrial situation has made me debtor to many and greatly lightened my work.

1.

INDUSTRIAL EDUCATION FOR THE CITY OF HAMILTON.

Outline.

I. Introduction:

- a. Importance of the problem.
- b. General description of Hamilton.

II. The Measurement of School Efficiency:

- a. Detailed facts for Hamilton.
 - 1. As to efficiency in reaching children.
 - 2. As to efficiency in holding them.
- b. Discussion of methods of measurement and comparison of results.
- c. Vocational tendencies of those leaving school.

III. Vocational Education As A Factor For Increasing The Efficiency of the Hamilton Schools.

- a. Survey of the industrial field.
- b. The attractive power of industry compared with that of the school.
 - 1. Comparison of Massachusetts with local situation.
 - 2. Classification of causes for leaving school and estimation of their proportional weights.
- c. Conditions encountered by those leaving school.
 - 1. Wages and employments offered.
 - 2. Opportunities for promotions, increase of wages, learning trades.
 - 3. Laws and social forces helpful or hurtful to youths 14 to 18.

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- d. Arguments for industrial education.
 - 1. The manufacturer's interest.
 - 2. The labor unions' interest.
 - 3. The state and national interest.
 - 4. Community interest.
 - 5. Philanthropic interest.

IV. Plans For Promoting Industrial Education In Hamilton.

- a. By private or philanthropic direction.
- b. By provision of separate industrial schools as part of the public school system.
- c. By incorporation in the secondary school.
- d. By incorporation in the elementary schools.

The most important advance in educational practice of the last two decades has probably been the forward movement variously known as industrial, vocational or trade education. There is much confusion regarding the usage of these terms. Dr. Elliott¹ of the University of Wisconsin defines vocational education as "that whose controlling purpose is to fit for a calling or vocation"; and industrial education as "that form of vocational education whose controlling purpose is to fit for a trade, craft or special division of manufacturing work." A trade school is defined as "an industrial school in which practical work, at least as exercises, if not productive, is a prominent feature." His complete and excellent analysis of these terms may be accepted as an interpretation of the terminology endorsed by the best usage today. It is proposed in this thesis to show the need of industrial education for the city of Hamilton; a need arising both from the school situation and the industrial situation; and to set forth definite plans for such industrial training. The evidences presented have been gathered by a careful investigation, covering a period of two years, of school and industrial conditions here, and by comparing them with such conditions elsewhere.

1: Bulletin #12 National Society for the Promotion of Industrial Education; Legislation upon Industrial Education in the United States pp.18-22
Elliott Edward C. and Frosner C.A.

If industrial education is the most noticeable movement in educational practice in recent years, an equally notable advance in educational philosophy has come through recognition of the fact that education is a branch of biology; that its foundation principles are to be sought in the fundamental principles of biology; that the aims and the methods of education, and, in fact, the very justification for its being, have a biological basis; and, finally, that the scientific methods applicable to the investigation of other fields of biology are appropriate to the study of education. This position is ably defended by such writers as O'Shea,¹ Miller,² and Bolton³, who are attacking educational problems from the strictly biological standpoint. Laying aside time-worn theories they seek to study education in the attitude of mind that the student of the science of Life must assume, and to apply to its study scientific methods. In the whole field of biology, as in other modern sciences, advance has been most rapid when measurement has been most precise and complete. Accurate and specific measurement has proven the solvent for mysteries which speculation has long attacked in vain. One

1: O'Shea, Dynamic Factors in Education; Education as Adjustment.

2: Miller, Psychology of Thinking.

3. Bolton, Principles of Education.

of the most striking examples is the rapid growth of the science of agriculture since accurate measurement has been applied to the investigation of its problems. In one of the most recent and comprehensive works on the principles of breeding, the author remarks in his preface: "Nothing is clearer than that the successful breeder of the future will be a book-keeper and statistician."¹ By the patient keeping of many records and comparison of manifold results did Mendel and DeVries establish their great discoveries and give biology the right to speak of "the mathematical nature of descent" and "the formula of ancestral heredity." Such phrases would have been meaningless not many years ago, but today they are the common expressions of biology. The acceptance of this method by scientists in general has been so complete that Dr. Elliott confidently asserts, "The trade-mark of the twentieth century will be measurement."² The application of this method to the study of educational problems is the logical sequence of the acceptance of the biological basis for education. So there are many investigators who propose to measure mental activity, to measure the efficiency of the school and

1: Davenport Eugene, Principles of Breeding, p.VI.

2: Elliott Edward C., Univ. of Wis. Summer School 1910,
Lectures on School Supervision and Administration.

4.

to measure the efficiency of the teacher. Thus, a recent writer in the Educational Review proposes to make the rise of income the economic measure of school efficiency, asserting "There are no other cases (except savages and aristocrats) where morality and culture can rise without a preceding rise of income."¹ If any practical method of applying such a measure could be found, many educators would object to its sufficiency; for the measurement of the efficiency of the modern school is a very complex problem involving a large number of factors, many of which are obscure in their influence and difficult to measure. However unsatisfactory the standard of measurement or incomplete the experiment, it can scarcely be denied that every such investigation honestly conducted and truly interpreted, will give a better understanding of the situation.

Without any pretence of finality, the following attempt to measure the efficiency of the public schools of Hamilton will deal with three phases of the problem: First, efficiency in getting the children into school: Second, efficiency in holding them: Third, value of school training to them. It is believed that even though the problem is much larger, these are sufficient to show the need of industrial education.

1: Patten S.N. The Economic Measure of School Efficiency. Educational Review, May 1911; p.476.

It may be well first to give brief attention to the size and general character of the city. The population of Hamilton by the census of 1900 was 23914; by that of 1910 it is 35279,- a gain of 47.5 per cent. This rapid growth has not been due to any large influx of foreigners, but a small per cent. of the population being of foreign birth. The rapidly developing industries of the city have attracted the mechanic and tradesman, many of whom are of German parentage; so that in the last two decades Hamilton has changed from being simply a distributing point for the rich agricultural surplus of the Ohio Valley to a city whose principal activity is manufacturing, which, together with the other industries, will be more fully described in a succeeding paragraph.

T A B L E I.

School Census of City of Hamilton for Years 1902-1910.

Year	:Ages : 6-7	:Ages : 8-13	:Ages : 14-18	:Ages : 16-20	:Total :
:	:	:	:	:	:
1902	:1605	:3208	:1366	:2876	:8844
1903	:1878	:3265	:1713	:2686	:9542
1904	:2265	:3940	:1790	:2320	:10315
1905	:1736	:2853	:1071	:2077	:7737
1906	:1662	:3392	: 853	:2729	:8636
1907	:1988	:3240	:1062	:2762	:9042
1908	:1848	:3565	:1347	:2977	:9327
1909	:2165	:3640	:1551	:2905	:10261
1910	:2206	:3434	:1484	:2869	:9993

- In 1910, of the 14-15 year old group, 720 were male and 764 female.

The sources of Table I are the reports of the school census made each year to the county auditor.

This Table shows the school census from 1902 to 1910. The instructions given to the enumerators who take this census are to count as six years old those children who have passed their sixth birthday and are not yet seven, etc. Two peculiarities of this table need comment: First, the relatively large size of the 14-15 year old group, in 1910 numbering 1484 out of a total of 9993. This is due to the fact that 14 is the limit of compulsory education, and many parents, eager to take advantage of this fact, impose upon the good nature or inexperience of the enumerators, who accept without question the parents' statement of the age of the child, and who, too frequently, accept it without making clear to the parent the basis upon which the age is to be reckoned.

The second point demanding comment is the sudden fall in 1905 from a total of 10315 to 7737. That a large part, at least, of this is due to an honest enumeration in 1905 and the padding of the census returns in the preceding

years is generally admitted by those in a position to know.

The first and second questions of getting the children into school and of holding them there are only in part dependent upon the efficiency of the school organization. In a large measure they depend upon the character of the State laws for compulsory education. The efficiency of the school organization is shown by its enforcement of the law, by the necessity of such enforcement, and its power to reach and hold children beyond the limits of the law. The compulsory law of Ohio requires to be continuously in school during the entire session all children between the ages of eight and fourteen, and also those between the ages of fourteen and sixteen who have not completed the fifth grade. The law further provides that all minors who are not employed may be required to attend school until they have attained their seventeenth birthday; and that minors who are employed, but who have not completed the eighth grade, may be required to attend part time classes, not to exceed eight hours per week, when such classes are established by the board of education.¹

1: House Bill No. 452 Ohio Session Laws 1910.

T A B L E II.

Total Enrollment Hamilton Public Schools 1909-10.

Age :	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Total
4. Boys																30
Girls																36
3 B												18	11	16	3	48
G												10	17	9	1	37
2 B												12	22	12	3	49
G												12	33	10	2	58
1 B												2	12	17	9	65
G												16	39	19	2	79
Grade																
8 B									2	16	42	40	19	2	1	122
G									1	14	48	25	13			101
7 B									18	49	44	18	8	2		139
G									30	56	39	24	6	1		156
6 B							3	19	46	70	47	25	3			210
G							42	72	75	39	12	1				244
5 B						1	36	48	60	46	39	12	4	2		247
G						37	61	58	39	29		7	3	1		236
4 B				1	34	68	81	51	30	14	8	1				288
G				2	48	100	73	48	28	13	4	2				318
3 B		2	40	106	93	42	42	14	10	4	1	0	0	1		353
G		50	91	89	37	24	8	3		0	0	0	0	2		306
2 B	3	73	136	91	38	16	18	6	3	0	1					385
G	4	72	117	62	37	20	11	7	4	3	1					338
1 B	114	153	66	29	19	2	5	2	1	0	1					392
G	99	158	66	25	11	3	2	1	0	1						366
Totals	220	458	478	487	531	444	486	463	404	270	184	83	74	14	5	

Table II shows the total enrollment by grades and ages in the Hamilton Public schools for the year 1909 - 10. Our schools employ a system of recording the day, month and year of birth, rather than the age. From these records the ages were computed on the same basis as in Table I, a child being considered as six years old unless he had passed his seventh birthday before June 1, 1910. Remembering that Table II shows the total enrollment, the above conclusions must be modified to express conditions truly. A rough correction is obtained as follows: Table III shows the total enrollment compared with the actual number remaining at the close of school, June 10, 1910. In the four upper grades, where most of the 14-15 year old group is found, the number remaining is 1225 or but 84 per cent. of 1455, which is the total enrollment for the same four grades.

Applying this correction to the 14-15 year old group of Table II, we have 84 per cent of 676 (406 plus 270) or about 570, the number of children in this group actually in school in May 1910. In order to check further this calculation a careful count of the 14-15 year old group remaining in May 1910 was made at three of the larger buildings of the elementary school. Out of an enrollment in the three

buildings of 192 who belonged in the 14-15 year old group, 50 had withdrawn before May first, not counting transfers to other schools in the city. In these three schools more than 26 per cent. of the total enrollment of this group had withdrawn before May first. Making due allowance for the smaller percentage of withdrawals from that portion of the group within the High School, it would seem that the correction first made was hardly liberal enough; that certainly not more than 570 of this group were actually in school in May 1910 when the enumerators of the school census reported 1484 in the city.

T A B L E III.

Enrollment and No. Remaining in Hamilton
Public Schools June 10, 1910.

	Enrollment.			No. Remaining.		
	Boys	Girls	Total	Boys	Girls	Total
Grade 1	392	366	758	308	291	599
" 2	385	338	723	350	297	647
" 3	353	306	659	314	270	584
" 4	288	318	606	245	281	526
" 5	247	236	483	205	199	404
" 6	210	244	454	170	228	398
" 7	139	156	295	118	123	241
" 8	122	101	223	97	85	182
Total	2136	2065	4201	1807	1774	3581

Where are the others? The records of the superintendent's office show that 372 of this 14-15 year old group had age and schooling certificates; therefore, presumably had employment. Some were in private and parochial schools.

T A B L E IV.

Enrollment in Private and Parochial Schools--Hamilton 1909-10
as reported by head of each in personal interview:

	Age 6-13	Boys Girls	
		Age 14-15	
Catholic High School		67	
Academy Notre Dame			75
St. Stephen's	348	10	22
St Joseph's	435	0	0
St. Peter's	163	1	0
St. Veronica's	165	0	0
St. Mary's	234	7	9
St Ann's	75	0	0
Zion	71	4	3
Immanuel	44	2	1
Business College		6	8
Total	1535	97	118

From the statement of the enrollment in these schools as given in Table IV, the 14-15 year old group contained 815 children; the ages being computed on the same basis as in Tables I and II. So that the total situation for this group may be summed up as follows:

T A B L E V.

The 14-15 Year Old Group June 1, 1910.

Number in public schools	570
Number in private and parochial schools	215
Number having certificates permitting employment	372
Number unaccounted for	327
Total	1484

In regard to the children under fourteen years of age, 3567 enrolled in the public schools and 1535 in the parochial schools, give a total of 5102 compared with the census total for the same group, 5640. Since many children do not enter school until seven or eight, this may be taken

as indicating that practically all of the 8-13 year old group is in school.

The foregoing then is a statement of the efficiency of the Hamilton school system in getting into school those who, by law, are fully within its control. The 327 children of the 14-15 year old group unaccounted for make more than one-fifth of that group. This may appear a lax enforcement of the compulsory education law. But no one at all familiar with the situation can so interpret it. It is doubtful if in any city of Ohio this law is more carefully enforced. Teachers must investigate every absence promptly and report all suspected truants at the opening of each session. The truant officer investigates with equal promptitude these reports and enforces the law in the courts if need be. Some of the 327 may have held doctors' certificates showing their physical unfitness to attend school, of these, unfortunately, the records are not very complete; a few may have been under private instruction or absent from the city. But no doubt the principal discrepancy arises, as was pointed out above, from the antiquated method which obtains under the present law for taking the school enumeration. The data are collected so carelessly

as to be nearly valueless. The complement of a good compulsory education law is a vigorous and complete system of collecting and recording vital statistics. Until laws are passed and enforced which will place in the hands of the school authorities definite statistics of all the children in the district it will be impossible to determine with accuracy how effective compulsory education is. Knowing the vigor with which the old compulsory law was enforced, it is easy to believe that under the new law Hamilton schools will reach a very high point of efficiency in this particular.

But far more discouraging is the situation with regard to the second phase of the problem, namely, the efficiency of the public school in attracting those who are beyond the compulsory limits. An inspection of Figure 1, which is a graphic representation of the facts of Table II, shows how swiftly the enrollment falls after the age of fourteen is reached. This is not a condition peculiar to our city; but, for several years, educators have been calling attention to its prevalence elsewhere; and it has been frequently pointed out as one of the vital defects of

American educational systems. It has been proposed to make this rate of elimination of pupils from the grades an inverse measure of the efficiency of the school; and by combining it with the rate of retardation, to obtain an index of efficiency. Perhaps the most notable attempt to formulate comparative estimates for various cities on this basis, has been that of Ayres in his work, *Laggards in our Schools*. He tabulates some sixty-one cities with their rates of efficiency.¹ If we follow his method, which he explains in detail in Chapter XVII, we obtain results for Hamilton as shown in Table VI.

T A B L E VI.

Index of Efficiency of Hamilton Public Schools-

Ayres' Method.

Average annual number of beginners	481
) Grade 1	1577
) " 2	1503
Membership of) " 3	1368
grades on a) " 4	1259
basis of 1000) " 5	1004
beginners) " 6	943
) " 7	613
) " 8	463
Total	8730
Index of efficiency	49.2

1: Ayres, *Laggards in our Schools*, pp.180-181

Briefly, his plan is to construct a table showing enrollment by grades, making the membership of each grade such a part of 1000 as the actual membership is a part of the number of beginners. The number of beginners is determined by taking the average of age groups seven to twelve inclusive. Using the relative figures of the table, divide the number of grades times 1000 by the total membership of the grades. Using the same figures find the average of grades seven to final inclusive. Considering the last two results as percentages, find their product. This product will be the index of efficiency.

T A B L E VII.

Comparison of Ohio Cities:- Ayres' Method.

			Index
Cleveland	based on total enrollment	1905-6	49.9
Cincinnati	" " enroll. at given date	1907	47.5
Columbus	" " total enrollment	1906	56.8
Dayton	" " " "	1906-7	56.0
Newark	" " enroll. at given date	1908	63.7
Springfield	" " total enroll.	1907	63.4
Hamilton	" " " "	1909-10	49.2

Taken from Table 101, p.183, Ayres' Laggards in Our Schools.

Table VII shows his result for six other Ohio cities compared with the result for Hamilton. The comparison is not encouraging to us.

A careful study of this method reveals some serious objections. The author laments the meagerness of school records in most cities, and proceeds to obtain the average annual number of beginners by the following rather dogmatic method: The average of the generations of the ages from seven to twelve is considered the average annual number of beginners.¹ He finds complete records for checking this method in but a single city,- Reading, Pa. The records of the city of Hamilton show that this method gives a result more than seven per cent too large. Table VIII gives the number of beginners for six years with an average of 448 instead of the 481 as found by Ayres' method; which erroneous number is made the basis for most of his computation in determining the index of efficiency.

Table IX shows that this initial number may vary from 420, the real number of beginners in 1902, to 481, the theoretical number according to Ayres, without noticeably affecting the result. The utility of a method may be

1: Ayres, Laggards in our Schools, p.52.

doubted when variations of more than twelve and a half per cent. in the initial figures give variations of less than one-half of one per cent. in results.

T A B L E VIII.

Beginners in Hamilton Schools.

1902	420
1903	missing
1904	"
1905	418
1906	423
1907	465
1908	503
1909	458
Average	<u>448</u>

T A B L E IX.

Comparison of Results by Ayres' Method, using:

- A.- theoretical number of beginners:
- B.- real average " " "
- C.- actual number of beginners in 1902

Grade:	1	2	3	4	5	6	7	8	Total:	Index:	Beginns.	No.of
A	:1577	:1503	:1367	:1259	:1004	:943	:613	:463	:8729	:49.28	:481	
B	:1692	:1614	:1471	:1352	:1078	:1013	:658	:497	:9375	:49.23	:448	
C	:1804	:1721	:1569	:1442	:1150	:1080	:702	:530	:9998	:49.28	:420	

Before leaving Ayres' discussion concerning grade distribution and relative efficiency, one further criticism must be made upon a very important point. The author points out the fact that grade distribution is largely affected by the population factor; a matter, as he justly remarks, "which has been entirely overlooked in much of the current discussion of the problem." And he concludes that, because of this population factor, under ideal conditions of progress and retention of pupils in school, we should not expect to find more than 871 children in the eighth grade for each 1000 beginners;¹ there being an increase in the lower grades due to the natural increase of population, and a decrease in the upper grades from death. The numerical result he obtains from statistics of the whole United States. That these figures fall far short of representing the influence of the population factor in Hamilton is evident from the fact that Table I shows an increase in school population of nearly thirty-three and one-third per cent. in five years. The last decade has been one of very rapid city growth, and the population factor needs close study before conclusions at all

1: Ayres, Laggards in our Schools, pp. 22-26.

definite may be drawn regarding the comparative efficiency of city school systems. If the curve of school population be compared with the curve of school enrollment, as in Figures 2 and 3, it is evident that the population factor has a very important bearing upon the distribution, both by grades and by ages, of the total enrollment.

Turning from the destructive to the constructive attitude, I submit the following: Where accurate age records are kept it is a very simple matter to secure the exact ages of pupils entering school and the exact ages of those completing the final grade. The difference between the medians of these two groups is the actual number of years and months required for the average child to complete the work of the school. The ratio of the theoretical time required to this result is a very real measure of how nearly the school succeeds in doing what it proposes to do; a real measure of efficiency of organization. Taken into consideration together with the table of promotions, it reveals not only the amount of discrepancy between theory and practice, but also the particular part of the school system where such discrepancy is most marked.

These facts for the Hamilton schools are as follows:

In 1910 the median age of the beginning class was 6 years 2 months, and the median age of the group completing the final year was 16 years one month. These median ages are computed from the same date, June 1, 1910; for the beginning class the June before they entered school and for the eighth grade the June when they finished their grade. The time, then, required for an average child to do eight years' work in the Hamilton schools is eight years 11 months, or the difference between 16 years one month and 6 years two months. This conclusion rests partly upon the assumption that beginners enter now at practically the same age they did nine or eight years ago. The truth probably is, that they enter at a slightly later age; due to greater vigilance in requiring proof of age in doubtful cases. If out of 8 years 11 months schooling, 11 months, or more than ten per cent. of his time, represents waste to the average child, the efficiency of the school organization, viewed as to economy of time in accomplishing a set purpose, is but 90 per cent. It may be urged that this waste represents rather the necessary retardation of children mentally or physically defective; or that some

local cause, as, for instance, a large percentage of pupils having foreign parentage, should be regarded as the true cause. To which objections the only answer is that modern educational standards demand that the defective or abnormal child shall receive separate consideration, and that the school organization shall be adapted to local conditions. If the average child requires more than nine years to do eight years' work, the failure must lie somewhere in the school organization. Table X, which shows the number and percent. of children not promoted in each grade in June 1910, indicates that the efficiency of organization is, at present, greater in the upper grades than it is in the lower.

T A B L E X.

Number and Per Cent. of Non-promoted Pupils--Hamilton Public Schools, June 1910:

Grade:	No. remaining: in grade	Not promoted:	Per cent. not promoted
1 :	599	136	22.7
2 :	647	117	18.0
3 :	584	109	18.6
4 :	526	120	22.8
5 :	404	33	8.1
6 :	398	64	16.0
7 :	241	22	9.1
8 :	182	1	0.5

A second measure of the attractive power, therefore of the efficiency, of the school system is the ratio of the number of children who remain in school after reaching the age when choice is legalized to the possible number that might remain; or the ratio of the number who remain, to the number of those who are attracted from the school by opportunities to labor. The second ratio is more practical than the first, because the first is largely dependent upon the population factor, and still more largely affected by the attractive power of other school systems near and remote, a force very difficult to measure. Most city school records will furnish the necessary data for the latter ratio. They have already been presented for Hamilton in Table V. Of the 14 - 15 year old group 570 were attracted to the public schools and 372 to industry; or out of this total of 942 the public school held slightly more than sixty per cent. That both the elementary and secondary schools are responsible for this result and that the per cent. retained grows rapidly smaller in the later years of the high school are very evident facts. But for purposes of comparison this may be called the measure of attractiveness of the school system; and combined with the time measure of effectiveness discussed above be taken to con-

stitute a real index of efficiency. The advantages of the proposed method over Mr. Ayres' lies in the following points. First, because variation of the index is dependent upon two real factors of efficiency of organization; namely ratio of theoretical to actual time required to complete the work, and ratio of actual to possible enrollment. Second, because each of these factors may be accurately determined and neither is greatly affected by the obscure factor of population. Third, because variation in either of these factors will noticeably affect the index. Finally because the result is more dependent upon present than upon past conditions of school organizations. Stated differently, any improvement in school organization will promptly be reflected in the variation of the index.

Except a brief study of high school attendance in Massachusetts and New York in which the ratio of enrollment in secondary schools to total population is deduced,¹ no figures are available for a comparative study. So the results for the City of Hamilton can only be considered absolutely. But they clearly reveal the fact that there is great need of such changes of organization as shall enable the average pupil to do eight years' work in eight years instead of nine;

1: J.R. Parsons Jr.: High School Attendance,
Ed. Rev. Vol. 27 pp. 293-298.

and especially such changes as shall enable the public school to attract and hold boys and girls after the law has loosened its grip upon them.

T A B L E XI..

Employments, Age and School Certificates 1909-10.

Age June 1 1910	14		15		16		17		TOTAL
	B	G	B	G	B	G	B	G	
Sex									
Foundries	19		15	2	9		5		50
Wire Works	22	2	8	3	4	1			40
Private Homes	8	12	2	14	2	1			39
Knitting Mills			10	1	12		12	1	39
Tobacco Factory	5		8		7	5	6		29
Castor Works	4		10		7	1		1	23
Machine and Tool Works	7		7		4		1		19
Retail Trade	5	2	10	2	2				21
Novelty Works			6	1	7		4		18
Safe Works	1		8		3		1		13
Can Manufacture	2		4	1	4	1	2		14
Carriage Works	1		2		1	1			6
Mattress Factory	3		3		1				7
Woodworking	4		1						5
Amusements	1	1	2		2		1		7
Telegraph and News			3		2				5
Laundries					3		1		4
Metal Pattern Works					1			1	2
Autograph Register Works					1				1
Tinner	1								1
Railroad	1						1		2
Dry Cleaning and Dyeing			1		1				2
Unclassified and unreported	6	6	9	1	5	2	2		31
Total	88	40	96	46	53	31	20	4	378

Table XI which is a summation of age and schooling certificates granted in 1909 - 10, gives some idea of the industries that attract boys and girls away from the schools. Nearly half enter the metal working industries; foundries, wire works, caster works, safe works, machine and tool factories, metal pattern making and autographic register works. Private homes, the knitting mills, tobacco factory, novelty works and the retail trade are the other occupations that take large percentages. A dozen other occupations are represented. But it needs to be borne in mind that these are not necessarily the vocations which children prefer; nor indeed, those they will probably pursue in adult years, Very seldom do you find them in any of these places learning trades. They are generally found doing some sort of piece work that requires little skill or supervision. Many vocations which they would like to enter are closed to them; either because the employer finds it more satisfactory to hire men and women, or because the work is such that boys and girls cannot perform it. A striking instance is seen in the fact that not a single boy or girl appears in Table XI to have entered the paper making business altho' it is one of Hamilton's chief industries, the Champion Coated Mill

alone employing 1800 men. No doubt a very large number of those who leave school before eighteen have drifted after a few years into the paper mills. The next four tables XII to XV present a study of all the individuals enrolled in four consecutive eighth grades of a suburban Hamilton school. The information tabulated covers the experience of each individual to the present time (Sept. 1910). The ages were given to the nearest birthday at the beginning of the term. The pupils included in these four classes came from homes that may be called ordinary though perhaps better than the average home in the city. Two features are very apparent in these tables. First, that failure to secure promotion in the eighth grade had a decided effect toward seeking employment; and second, that but rarely was the first vocation a permanent one. Of the nineteen pupils included in the first two classes but four remained to finish the high school work.

T A B L E XII.

Study of all Individuals Enrolled in Eighth

Grade, Lindenwald, 1904-5.

Pro-

-Boys-

NO: Age promoted; Occupation since.

1	13	Yes	Completed H.S. in five years; farmed.
2	14	No	Learn machinist trade - buys oil route - machinist
3	13	Yes	Machine shop - Book-keeper - lumber inspector
4	14	No	H.S. one year - helps father - machinist and plumber.
5	13	Yes	In tool- room of machine shop.

-Girls-

1	14	No	Remained at home.
2	15	No	At home - studied music - married - divorced.
3	13	Yes	H.S. four years - studied to teach - at home.
4	14	No	At home - clerking in grocery.

T A B L E XIII.

Study of all Individuals Enrolled in Eighth

Grade, Lindenwald, 1905 - 6.

-Boys-

No.	Age	Pro-moted:	Occupation since.
1	14	No	Left school in 8th - clerking for father
2	15	Yes	H.S. one year - Woolen Mills - Collector
3	15	No	Re-entered 8th - helped father - carpenter - machinist
4	13	Yes	H.S. four years - Secy.of Bus.Club. - Drug Clerk

-Girls-

1	13	Yes	H.S. two years - at home.
2	12	Yes	H.S. one year - at home one year - re entered H.S.
3	13	No	Bus. College one year - in office of wholesaler
4	14	No	At home - married.
5	14	Yes	H.S. four years - at home
6	14	Yes	H.S. one year -working in private home.

T A B L E XIV.

Study of all Individuals Enrolled in Eighth
Grade, Lindenwald, 1906-7.

- Boys -

No.	Age	Pro-moted	Occupation since.
1	13	No	Learns machinist trade
2	15	Yes	H.S. one year - blue print room - draughtsman
3	15	Yes	H.S. part of one year - worked in many shops
4	16	No	Helped father - carpenter - machinist
5	13	Yes	H.S. fourth year - clerking vacations
6	14	No	Re-entered 8th - H.S. two years - clerk- woolen mills
7	14	Yes	H.S. one year - learned moulder's trade

- Girls -

1	12	Yes	H.S. one year - knitting mills
2	16	No	At home - woolen mills
3	14	No	At home - clerking in grocery
4	15	No	Bus. college one year - cashier - married
5	14	No	At home - studied music - woolen mills
6	13	Yes	H.S. fourth year
7		Yes	Woolen mills
8	12	Yes	H.S. fourth year
9	13	No	At home - studied music

T A B L E XV.

Study of all Individuals Enrolled in Eighth
Grade, Lindenwald, 1907 - 8.

No.	Age	Pro-moted	Occupation since.
-Boys-			
1	14	Yes	H.S. third year
2	16	No	Learning moulder's trade
3	14	Yes	Farming
4		Yes	H.S. one year - entered Ger. Prot. Normal
5	15	Yes	H.S. two years - clerking - woolen mills
6	16	Yes	H.S. third year
-Girls-			
1	13	Yes	H.S. third year
2	14	Yes	H.S. third year
3	13	No	Re-entered 8th - H.S. two years
4	14	No	Re-entered 8th - H. S. two years
5	14	No	Re-entered 8th - telephone exchange
6	17	Yes	H. S. third year
7	13	Yes	H. S. third year
8	13	Yes	H. S. third year
9	16	No	At home

This, then, is one of the great problems of the public schools; to increase their attractive power. For over against them is set the attraction of industrial life, appealing insistently and unremittingly to every wide awake boy and girl.

A study of the industrial situation ought to contribute to the solution of the problem. Hamilton is the center of a rich agricultural territory. Electric and steam railways ramify through the fertile Miami Valley, where mixed farming prevails with wheat and corn as staple crops. The soil of this valley seems especially well adapted to corn growing, and stock raising is important; especially important is hog-raising, though dairying is a close second, both Hamilton and Cincinnati affording good markets for dairy products. These facts have no slight bearing upon the school situation. Many boys from the higher grades of the city schools go to work on farms; and many country girls and boys are attracted by the city schools. During the year 1910-11 65 boys and girls in country homes were enrolled in the Hamilton High School. It can scarcely be doubted that an agricultural course in the High School would find strong support.

But the pre-eminent interest of Hamilton is manufact-

uring. And first among manufacturing interests are the machine and tool shops and metal working industries. The U.S. Census report of 1905¹ places the number of employes in foundry and machine shops at 2043 or 33 per cent of the whole number of men employed in all manufacturing industries. The report of the State Inspector of workshops and factories for 1909 gives 4224 employes in metals, machinery or apparatus, or 56 per cent. of the whole number employed in all manufacturing industries. The Chamber of Commerce of the City of Hamilton finds practically the same proportion, though placing the totals somewhat higher; its estimate for the same year 1909 being 4750 as the total number of employes in metal work (foundries, machine shops, stove foundries, safe, can and wire factories). This, it should be remembered, is the report for a year when industrial depression was very marked, and many of the larger factories had but a small part of their full complement. It is interesting to note that in variety of product, the metal working industry is equally pre-eminent; of the two hundred and fifty different articles made in

1. Census of Manufacturers 1905 Bulletin 58, p.54-5

Hamilton, as enumerated by the Chamber of Commerce, fully sixty per cent. are products of these metal working industries. The out-put of the two safe factories, that of the machine and tool plant and of the Corliss engine plant are widely distributed. Not infrequently some boy in the grades takes a personal interest in the geography of a foreign nation, because his father is helping make machines or engines to supply the market of that country.

The industry holding second place, both with regard to the number employed and the capital invested, is the manufacture of wood pulp and paper. The number of employes is given by the U. S. Census Report as 860 or fourteen per cent. of the whole number employed in manufacturing; while the report of the State Inspector (see Table XVI) places the number at 1304 or seventeen per cent. of the whole number employed in manufacturing. The Chamber of Commerce estimates that, in good seasons, the number of employes in wood pulp and paper business is almost or quite 2000.

T A B L E XVI.

Number of Employes in Manufacturing Industries of Hamilton.

26th Annual Report (1909) of Dept. of Inspection of Work-shops, Factories and Public Buildings. - Ohio.

	Whole number	Males over 16	Females over 18	Females between 16 & 18	Males between 14 & 16	Females between 14 & 16	No. of minors without schooling certificate	No. of minors illegally employed.
Stone and Clay products	27	23	5	1				
Metals, Machinery and Apparatus	4254	3893	215	39	69	18		87
Car building and repairs	95	93	2					
Jewelry	54	50	24					
Lumber and Wood Manufactures	133	111	14	3	5			
Vehicles and parts	431	394	33		4			
Leather	14	14						
Paper and Pulp	1305	1043	256	6				
Printing and Lithographing	250	140	88	20	2			
Textiles	490	141	221	74		54		35
Tailoring and Dressmaking	11	2	9					
Food and Dairy Products	145	90	51	3		1		
Tobacco	260	101	85	68	6			74
Ice and Liquors	98	96						

The carriage, textile and tobacco industries are important, each employing from 400 to 600 hands. There are many minor industries, the U.S. Census Report enumerating in all forty-six, classified as factories whose annual output exceeds \$500.¹ These are exhibited in Table XVI under the more compact classification of the State Inspector of Workshops, Factories and Public Buildings. Taken in connection with Table XVII which is a summary of the non-manufacturing industries comprised in the same report, the overshadowing importance of the metal working industries is apparent.

T A B L E XVII.

Number of Employes in certain non-manufacturing Industries of Hamilton. Compiled from 26th Annual Report (1909) of Department of Inspection of Workshops, Factories and Public Buildings. - Ohio.

	Whole number	Males over 16	Females over 18	Females between 16 and 18	Males between 14 and 16	Females between 14 and 16	No. of minors without schooling certificate	No. of minors illegally employed
Distribution of water, gas and electricity	43	43						
Telephone and Telegraph Exchange	78	15	63					
Grain Elevators	9	6	3					
Bake Shops	88	55	31		2		2	2
Mercantile Establishments	418	126	281	4	7			
Hotels	21	14	7					

Table XVIII presents the estimate made from data gathered by the Chamber of Commerce as to number of employes and value of annual out-put, of industries employing more than fifty.

T A B L E XVIII.

Employees and Annual Out-put of all Industries Employing More Than 50 Men. Chamber of Commerce Report.

	Total No. of Em - ployees	Value of annual out- put.
Foundry and Machines and Stoves	2800	\$7 790 000.
Paper and Wood Pulps	1555	7 060 000
Safes	1200	4 500 000
Carriages	500	90 000
Can	450	250 000
Tobacco	400	
Wire	300	375 000
Garments	250	
Felts	140	375 000
Printing	150	250 000
Sanitary supplies	107	200 000
Lumber, wood work, planing mills,	100	300 000
Autographic - Register	95	165 000
Caster	52	112 000
Mattress	75	250 000

This then is the industrial field against whose attractive force the public school must exercise its power of holding when the law lets go. However attractive the field may appear to the youth, there may be, as there certainly are, other forces acting with or against his own desires. What are the causes of his leaving school and what conditions confront him when he enters industry? The most careful study of this question which has so far appeared is the Report of the Massachusetts Commission on Industrial and Technical Education, 1906; more particularly the Report of the Sub-committee on the Relation of Children to the Industries, by Susan M. Kingsbury Ph.D. This study which was authorized by the Massachusetts legislature and directed by Dr. Kingsbury has been recognized as so fair and thorough a treatment of the situation in Massachusetts that it is constantly referred to as an authoritative answer to the questions: Are the years from 14 to 16 wasted years of the child's life? and What are the children doing? Its salient features may be summarized as follows: Among the causes that impel children to leave school the poverty of their parents plays a very minor part; hardly more than one out of

four leaving school for that reason. Second, the children fourteen to sixteen years old are not wanted in the industries of Massachusetts. Third, the children themselves are the losers by being out of school. No effort is made to show how much of inspirational and character-forming influence they lose by being out of school these two or three years; nor how much of value there is in the leisure for childish activities and pleasure, which they barter for the few dollars of wages doled out to them. But investigating only the material side of the child's welfare the conclusion set forth in the report is, that the child loses in wage-earning power by this early withdrawal from school. And worse still, the total earnings received by the time he is twenty-one or two will, in most cases, be less than if he had remained in school two or three years longer. On the average, seven years' wages of the youth who enters industry at fourteen will be less than five years' wages of the youth who enters at sixteen. And the wages of the latter increase at a much more rapid rate than do those of the former.

It is less difficult to present these facts convincingly to men and women of experience than to boys and girls. But it is the child that the appeal must reach if it is to be effective. For, as is shown above, it is not industry that seeks to draw him from the school. It is not, in most instances, the parents who push him out. But the impulse is from within and has its basis in a mistaken notion of values. The money value near at hand outweighs in his childish mind all the intangible good, potential in the two or four years of schooling lying beyond the compulsory limit. So, whatever can be done to make these facts more impressive to him, to make the good of schooling more tangible, will help to reduce these years which have come to be called "the waste years of American education" to what they should be,- the most profitable years of youth. Industrial and vocational schooling is proposed as that form of education which will most nearly solve the problem.

But before considering the efficacy of the proposed remedy, it is proper to attempt a diagnosis of local

conditions; to see how far conclusions drawn for Massachusetts will hold good in Hamilton. The following Table presents the record of 49 individuals enrolled in the eighth grade of a certain school occupying an average residence section of Hamilton. The 49 comprise the entire eighth grade enrollment in that building for a period of four years ending June 1908.

T A B L E XIX.

Reasons for Leaving School.

Records of 49 Eighth Grade Pupils.

Remaining for the completion of the High School course or until present time (3rd year for the last class)	15
Left because of indecision, lack of interest, or eagerness to earn	17
Left because discouraged by the difficulty of the work or by failure to secure promotion	6
Left because of ill health	5
Left because help was needed at home	3
Left because dissatisfied with course of study offered in High School	1
Left because of trouble with teacher	1
Left because father was unwilling for child to take High School work	1
	49

Gathered from personal teaching experience.

Every one of the individuals in the above list has been under the observation of the writer since enrolling in the eighth grade. So that this statement of causes is made from a thorough knowledge of the individual and of his home conditions. As a check against the errors due to personal judgment or due to locality studied, an equal number of cases are presented in Table XX. These individuals were selected at random from the workers in various industries. The statement of each individual as to why he left school was accepted as correct.

T A B L E XX.

Reasons for Leaving School.

Records of 49 Individuals in Various Industries.

Left because did not like school, did not like teacher, or eager to earn money	36
Left because help needed at home	7
Left because of ill health	2
Left Parochial school because there was no High School class at that time	2
Left because father feared immoral influence at High School	2
Total	49

It is evident that poverty is not the pressing cause which takes children from school in Hamilton. Even if due allowance be made for its contributory effect in causing parents to accede to the child's eagerness to enter industry, the report of the Massachusetts Commission that not more than one in four leave school for this cause, will certainly be liberal for Hamilton.

The evidence of these tables shows that probably 50 per cent. of the children that leave school in Hamilton before finishing the High School course, do so because they do not realize the value of schooling; or because they have become discouraged, or found stronger interests in commercial and industrial activity. Physical unfitness for school or discouragement arising from that cause is another factor of importance. But the greedy, unfortunate, or perhaps obstinate parent, unwilling or unable to permit his child the advantages of schooling so freely offered by the community, is but an infrequent factor.

But while the most distressingly heavy loss from the public school, after the compulsory limit is reached,

may be attributed to two or three general causes: as, lack of interest in schooling, lack of appreciation of its value, or discouragement by reason of failure to measure up to some arbitrary standard of excellence; still, any careful investigation of a number of cases will reveal the fact that causes have numberless phases and combinations. In truth, that while fifty individuals may state their reasons for leaving school in the same words, after all those reasons are as varied and as full of complex elements as are the lives of the fifty individuals. Suppose two boys are reported as having left school because of discouragement. The statement might probably cover two highly diverse cases; as, for instance, that of a boy so dull as to be nearly or truly defective and that of another boy unusually bright but highly sensitive and given to brooding over slight imperfections. The same remedy will by no means fit the two cases. The sensitive boy may need only a little sympathy and appreciation; but a radical change in the course of study may be the only salvation for the other fellow. Here, then, arises the necessity for the study of each individual case before attempting to

apply a remedy. This study would certainly devolve upon the boy's teacher. But it should be supplemented by a careful investigation made by some other person willing and able to take a genuine interest in the boy's welfare, and competent to criticize intelligently the teacher's attitude and work. Shall we lay this additional burden upon the supervisor's shoulders, or turn it over to some authority outside the school, such as the juvenile court? The answer is perhaps involved in the answer to the larger question: Shall the public school absorb and direct the great race redeeming social movements now organizing, or shall it remain tributary to them? To quote from a recent magazine article by Dr. Allen¹ of the Bureau of Municipal Research, New York: "The greatest social settlement work ever conceived is that of the school where principal and teachers are in sympathetic touch with children and their parents. - - - - Proper proportions will never be restored until school men and school women assume the responsibility which is theirs for leading their communities, -- furnishing most of the evidence,

1: Allen Wm.H. Civic Education through the Public Schools. The Hist.Teacher's Mag.Vol.II, No.7, p.158.

a great part of the inspiration and the working centers--in movements classified as social service, uplift and civic betterment." But whatever the attitude of the school toward this question, the necessity remains that remedies should be applied to individuals rather than to groups. If a large per cent. of the pupils taking a certain year's work in school drop out before finishing the year, it may mean that the course of study needs revision at that point, or that the teaching force of that grade needs stimulation. The probability is that neither remedy, nor both together, will reach every case, but that each individual must be studied and treated separately.

The condition of the child who today takes his place as one cog in the great machine of modern industrialism is certainly not an enviable one. Although the shocking conditions under which little children formerly worked in mines and factories have been removed by humanitarian efforts, more insidious evils still abound; evils, which on the whole are, perhaps, of graver moment to society. In his discussion of the child problem Dr. Mangold¹ enumerates race deterioration,

1: Mangold Geo.B. Child Problems, pp.191-200.

unfitness for social and political life, economic waste through untrained and unstable labor, accidents due to childish carelessness, as some of the general effects of the employment of children in industry. As he pertinently remarks,¹ "Successful men frequently oppose good laws (against child labor) because they themselves have not failed and have withstood the disadvantages of premature toil. They have thus become blinded to the evil effect of child labor and are often bitter enemies of the real interests of the child of today." Such opposition and the indifference of rural communities, where children though doing much of the farm labor, appear to be the better for it, have done much to hinder proper legislation. The Ohio statute, as amended in 1908, governing the employment of minors, is in many respects a model law.² No minor under sixteen years of age shall be employed at dangerous machinery or where its health will be injured or morals depraved. No girl under sixteen may be employed at the tobacco trades nor at any employment compelling her to remain standing constantly. Boys under sixteen and girls under eighteen must not be employed later

1: Mangold: Child Problems, p.168

2: Ohio Statutes: Sections 4364-67.

than six o'clock in the evening nor earlier than seven o'clock in the morning; nor employed more than eight hours in one day, nor more than forty-eight hours in one week. This latter provision has done much in the three years of its enforcement to discourage child labor. Many employers who perhaps might not have been influenced by humanitarian motives to yield their profits from child labor to the common good, have yielded to the pecuniary argument. For to have some machines idle during a considerable part of the working day or of the working week has frequently offset all of the gain of the cheaper wage paid to the child operative. Prosecutions under the law proceed from the chief inspector of workshops and factories and may be tried before any justice of the peace, police judge or mayor of any city or village. That this Ohio department is doing effective work is shown by the report for 1909 which indicates 245 prosecutions for violation of the child labor law and conviction in nearly 95 per cent. of the cases. None of these prosecutions occurred in Hamilton; but there is considerable violation of the law here, as is shown by Tables XVI and XVII which show a total

of 200 as the number of minors found to be illegally employed. One of the leading physicians of the city recently declared in a public address that there were conditions of lack of sanitation in some of Hamilton's industries which would be harrowing to contemplate. So there is evidently need of a stricter enforcement of present laws. The same report (see Tables XVI and XVII) shows but two cases of minors employed without schooling certificates; a comparison in law enforcement very creditable to the school administration, and agreeing with the conclusion expressed in a previous portion of this thesis that the enforcement of the compulsory attendance law in Hamilton is unusually thorough. For the whole state, according to the same report, the ratio of minors employed without schooling certificates to the number illegally employed is about one to five.

Most of the larger concerns, both manufacturing and mercantile, make some effort to train the boys and girls who come to them. Except perhaps one or two of the larger foundries, this training makes no pretensions to be an apprenticeship system. An opportunity to pick up a trade by

his own efforts and a little assistance from a busy foreman is all the boy or girl may hope for. And even this opportunity is not for the 14-16 year old group. The shops which make any effort to teach trades will not accept youths under sixteen for that purpose. If they employ those younger, it is for labor requiring small attention or responsibility. So we find most of this 14-16 year old group shifting from one to another of the unskilled occupations or following strictly juvenile employments. The statement of the Massachusetts report that this group is not wanted in industry is continually repeated by employers. Yet many of them feel that it is difficult to meet competition from other localities where child labor is less restricted. If the child labor question were made a national instead of a state issue this difficulty would be obviated. The wages earned by the juvenile workers are hardly more attractive than the employments offered them. Some of the better shops, as for instance the knitting mills, pay \$4 per week. Others where the work is less exacting, pay \$2 or \$2.50 as a beginning wage. In investigating one hundred cases from various industries, the median beginning wage was found to be \$3, the highest \$5 and the lowest \$2.

The increase for those who remain in the unskilled industries for the years from 14 to 16 is startlingly small, the average increase being but \$20 per year. . But many drift into the better shops and do much better. Thus, the average weekly wage of all the boys employed in one of the Safe Works, who had begun while under sixteen years of age and who had not been employed more than two years, was found to be \$6.42 Fourteen year old boys and girls need not expect more than \$2 to \$3 per week for a beginning wage, unless they are unusually well developed or have a strong friend in their employer. And this wage, small as it is, will be cut still lower by lay-offs and periods of idleness intervening between the various jobs, from one to another of which these juvenile workers are shifted by the changing demands of business and by their own unreliability. So that unless they have been unusually energetic and thrifty, two or three hundred dollars will represent their total earnings at sixteen. When we reflect how most of this is spent, and how little represents any real and necessary contribution toward their own support or the maintenance of a destitute family, who can doubt that society would be financially the gainer if the State were to demand those two additional years for training its youth.

and, if necessary, were to supply to the family the equivalent of the child's earnings ?

In some quarters industrial education has been regarded with distrust because it was so strongly indorsed by the manufacturing interests. Men who were already inclined to look upon the average manufacturer as thoroughly selfish, found in the new movement for vocational or trade teaching grounds for stronger suspicions. Many trade unions look with distrust upon the movement, apparently for the reason that they found it self-preserved to oppose anything regarded as beneficial by the manufacturers. But gradually the two sides seem to be shifting. The American Federation of Labor in convention at Toronto in November 1909 indorsed industrial education. On the other hand, in reporting the proceedings of the recent fourth annual convention of the National Society for the Promotion of Industrial Education held in Boston November 1910, the editor¹ of the American Machinist points out what seemed to him the one discouraging feature--that the meeting was attended by so few manufacturing interests. This loss of interest in the movement

1: Editorial American Machinist, Dec. 1, 1910.

by the manufacturers may be due to several causes. Perhaps the slowness of the public school system to agree upon a working plan for industrial education has led them to feel that they must seek elsewhere adequate relief for the economic demand for trained labor. Perhaps they have realized that industrial education incorporated in the public schools would mean a heavy tax without a corresponding share in its control. Hence we find them advocating modern apprenticeship and the corporation school instead of general industrial education. Mr. Arthur D. Dean,¹ in his book, *The Worker and the State*, presents as one argument for industrial education: It would afford society an opportunity of paying back some of the benefits it has received from the increased production due to factory methods. Supt. F.B. Dyer expressed much the same sentiment in his address before the Metal Trades Association;² "We hear employers prate about the degeneracy of modern workmen, the need of intelligence, of serious purpose, of the inventive spirit, of pride in good work,--in short, the need of honest, skillful, earnest, judicious men in our industries. If you had them, you say, you wouldn't fear the competition of

1: Dean Arthur D. S.B. Chief, Division of Trade-Schools, N.Y. State Education Dept.: *The Worker and the State*, p. 59, 60.

2: Synopsis of Proceedings of 12th Annual Convention of the Metal Trades Association, New York City, p. 37.

the world. Well, then, get them, make them. It can be done; not a bit of doubt of it. Put one-tenth of the net profit of your shops back into the education of your apprentices, and it will bear fruit ten-fold in ten years." These men who are interested in industrial education, not for the manufacturer's reason nor for the laboring man's reason, but from the standpoint of general interest in education, both feel that manufacturers would be paying back but a fair return for value received in bearing the burden of industrial education. Perhaps it is the fuller realization of this truth that is bringing from trade-unions the increasing demand for the incorporation of industrial education within the public school system. If there could be a general acceptance of the lofty teaching of Dr. Washington Gladden¹ that the old feudalistic and aristocratic relations between capital and labor must cease; that industrial democracy must be the legitimate accompaniment of political democracy; if, as he proposes, trade-unions should be treated by the manufacturers and capitalists as allies and friends, and should act towards capital in the same spirit, it would seem to be a simple matter to adjust the control and direction of industrial education in a manner satisfactory to both employer and employee.

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1: Gladden Dr. Washington: Industry and Democracy, Outlook, Vol. 97 No. 11, p. 589.

In the meantime, if the employe is to have justice, the State must assume the direction of vocational training and see to it that all interests are equally regarded.

To this argument for State control and support of industrial education may be added that of self-preservation. If History and Civics should be taught that the citizenship of the State shall maintain its high plane, industrial education may be justified for the same reason. Surely the ability to make an honest living is the first requisite to good citizenship. The knowledge of how to work is more valuable than the knowledge of how to vote. In a recent essay on the need of a moral equivalent for war in the discipline of the human race, William James suggests that such an equivalent may be found in honest toil; that, by engaging in some of the more laborious and hazardous occupations, young men would gain that robustness, hardness of fiber, and acquaintance with discipline, formerly supplied by military training. Such a theory would certainly involve national rather than State control of industrial education. The practical side of such action was recently suggested to the writer by one of the leading business men of Hamilton in a discussion con-

cerning the cost of industrial education. He advocated that this cost be borne by the national government without increasing taxation, but simply by curtailing military expenditures. There are many practical arguments for national control of vocational education: such as need of national regulation of child labor and need of uniformity in vital statistics. But until these ideals come to be more generally accepted, and as long as the State continues to be responsible for the system of public instruction, vocational training should not be divorced from State control. Ohio has been among the foremost in accepting this responsibility. Her recent law enacted in 1910 has been pointed out by Dr. Elliott¹ of the University of Wisconsin as the first statute enacted in this country for the compulsory after-training in day schools of those who are engaged in wage-earning occupations.

It should be borne in mind, however, that though the State assume a partial support and control of public education, it has always been the policy in Ohio to leave to the community the main burden of support and most of the control of its schools. No exception has been made in the case

1: Bull. #12 Nat. Soc. for the Promotion of Industrial Education: Legislation upon Ind. Ed. in U.S., p. 34
Elliott Edward C. and Prosser C.A.

of industrial education. It is left to each community to initiate its own plan and work out its own problem. Certainly it would not be wise, no matter how much of national or state support and direction might be advisable, to neglect the local conditions. Industrial education should be peculiarly local. Such industries as are foremost in any locality are the proper ones to be embodied in the local course of study. In return for this local control and local support the schools should strongly build up local interests. If the community would prosper it must make the study of its own necessities an important part of the training of its youth. There is a demand in Hamilton for such training. Business men want more practical training for the young people who enter commercial life. Manufacturers demand special training for their employes. Professional men and women who have felt the over crowding of their own ranks demand that this door of industry be opened wider and that the opportunities of business and industry be presented more clearly to the youth of the next generation. The strongest indorsement of all comes from that great body of toilers who themselves left school to plunge into industry without adequate preparation or intelligent choice.

After the consideration of these local, political and economic interests to be fostered by industrial education, it is reassuring to remember that industrial education first took practical form as a philanthropic movement; and that the principle it embodies, of relating the child's thinking to his activity and to the activities about him, has been the highest aim of the majority of modern educators. One of the most striking presentations of the need of each individual to learn the lesson of toil has been made by Count Tolstoy in a little booklet issued by the Interlaken School.¹ Tolstoy is thus quoted: "Do these things for your children; Let them do all they can for themselves; carry their own water, fill their own jugs, wash up, arrange their own rooms, clean their boots and clothes, lay the table. Believe me, that unimportant as these things may seem, they are a hundred times more important for your children's happiness than a knowledge of French or of History. These things train the child to simplicity, to work , and to self-dependence. If you can add work on land, if it be but a kitchen garden, that will be well. Believe me, that without that condition there is no

1: The Interlaken School: Edward A. Rumely M.D.

possibility of a moral education, a Christian education, or a consciousness of the fact that men are not naturally divided into the classes of masters and slaves, but that they are all brothers and equals." Another modern teacher, whose wide experience in noting the effects upon individuals of a purely industrial schooling, has given him some right to draw deductions concerning the influence of such training upon a race writes thus:¹ "It will make very little difference to the world whether one negro boy, more or less, learns to construe a page of Latin. On the other hand, as soon as one negro boy has been taught to apply thought and study and ideas to the growing of cabbages, he has started a process, which if it goes on and continues, will eventually transform the whole face of things as they exist in the South today." Industrial education is so modern a movement that it would be futile to try to draw from so brief an experience, however satisfactory, proof of its virtue, as the best form of training for complete living. But when both economic and philosophic reasons demand that it be a part, and an important part, of our educational system, the fact that there are more than one hundred

1: "Chapters from my Experience". Booker T. Washington.
World's Work, Vol. XXI, p. 13783; Dec. '10.

and fifty trade and industrial schools now established in the United States¹ may be taken as evidence that the demand is real. The rapidity with which the enrollment in these various schools grows is further evidence of the value of industrial education as a means of increasing the efficiency of the school. It certainly appeals to many who would otherwise be content without further schooling. For there seems to be no diminution of the popularity of the course. There is no need to go outside our own city to see how great this demand is; the evidence is plain in the crowded conditions of the manual training and domestic science departments of the High School and in the enrollment of 492 young men in night classes of the Y.M.C.A.

For the promotion of industrial education in Hamilton four possibilities appear: First, to establish it under private or philanthropic control. Second, to provide for it separate schools as a distinct part of the public school system. Third, to incorporate it within the secondary schools. Fourth, to establish it within the elementary schools. The first of these propositions has already received the hearty endorsement of the community in the enthusiastic support of the industrial courses offered by the Young Men's Christian

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1: Bul. #11 Nat. Soc. for the Promotion of Ind. Ed.
Edward H. Reisner.

Association. The forty or more courses, of which more than one-half are strictly vocational, enrolled nearly five hundred young men during the year of 1909-10. Its work is accredited by one hundred and twenty-six of the colleges and universities of the country. There is also a business college, operating under private management, which offers commercial training to those who are willing to pay its moderate fees.

Mention has previously been made of the apprentice system of the Estate Stove Company. The superintendent of this company recently informed the writer that their agreement with the stove moulders allowed them one apprentice to each five moulders and one to the shop; that under this agreement they usually had twenty or twenty-five apprentices. They require these boys to spend four years in learning the moulder's trade, and while they have no trouble in getting plenty of boys for apprentices, find it hard to get boys of good character. The apprentices in this foundry enter into no legal indenture. There are a few so-called apprentices in the machine shops. The foreman of one of the largest of these recently stated that of the six or eight apprentices under him only one had a right to the name.

Many of the shops of Hamilton have a few boys who could be persuaded to learn a trade, even if they are not eager to do so. Many of the employers would be glad to give these boys a better opportunity than they now get, to become skilled workmen. However, there is not enough unity in this demand, nor are those interested numerous enough to justify the establishment of public trade schools; nor of modern corporation or apprentice schools by each shop. A plan recently published in the American Machinist¹ seems the most practical of any yet proposed for such a situation. According to this scheme the various employers of a city form an educational corporation in which one share is equivalent to one boy. The corporation rents a shop, equips it, and hires an instructor. The stockholders send their boys to this shop to work, and are assessed for the running expenses,- instruction, rent, small tools, oil, waste, etc. They also send with the boy the material on which he is to work. When this work is finished it is returned to the factory, so the only extra cost to the stockholder is his share of the running expenses, which, except the one item of instruction, should be small. The

1: Another Trade School Plan: Henry E.F. American Machinist, Apr.13,1911, Page 679-680.

advantages to the boy are numerous. He continues to be self-supporting, he gets a variety of work under good instruction, and for this he is paid in proportion to his skill and speed; thus having a strong motive for improvement. One of the difficulties in making this plan successful is to find a strong instructor; a difficulty very common to plans for industrial education. A weak man would certainly make a failure of it.

The second proposition to provide separate schools for trade teaching which should be an integral part of the public school system, would certainly meet with great opposition for many reasons. It would be a very expensive plan, if made elaborate enough to meet the demands of the trades which are important in Hamilton. This objection alone is sufficient to defeat such a proposition, though many others, more or less valid, would doubtless be urged.

But there is a form in which this second proposition is perhaps the most feasible of the four: namely, that form of industrial education known as the continuation school. The experience of many German cities and of some of the larger cities of America where it has been tried, would indicate that

in this form of industrial education good results are more quickly and universally conceded than in any other. Cincinnati has been among the foremost American cities in this experiment. At first, in Cincinnati, this work was taken up by a group of manufacturers who felt the need of giving their boys some purely intellectual training, in order to bring them up and keep them up to high earning capacity. This training proved valuable, but the shops were found to be poorly adapted to this school work. It was transferred to a public school building, although at first, the public schools assumed no responsibility for the work. Soon it was very apparent that here was a new opportunity for the public schools to be truly useful to the community. Under the able direction of Mr. Renshaw, the instructor, the improvement in wage-earning power and industrial efficiency of the boys taking this work was so marked that it has ceased to be regarded as an educational experiment, but has become an integral and important part of the Cincinnati school system. Because this work seems to be one of the most practical and successful of the many different ventures in vocational training, and because it may

easily be adapted to a city the size of Hamilton, it will be described in detail. The first requisite is a teacher. He should be a skilled mechanic, familiar with modern shop methods, and he needs to understand boys and their training. Pres. Thwing remarks:¹ "The most important element in the teacher, it has come to be recognized, is sympathy." This certainly is true here. Doubtless the finding of the proper man for the teacher is the most difficult part of the problem. The second requisite is a school-room. It needs about the same equipment as a mechanical drawing room; desks suitable for the preparation of arithmetic and drawing lessons; drawers and lockers for storage purposes. The class is selected by the manufacturers of the city from their employes. There are no requirements as to previous amount of schooling. The manufacturer selects such boys as he thinks will profit most by the instruction, and pays them while they attend school, at the same rate that he does for shop work. Each boy spends one half day each week in the school room. The average class consists of about twenty boys. School is in session nine

1: Thwing: The History of Education in the United States since the Civil War. Page 102.

half days in each week so that one instructor and his assistant can care for nearly two hundred boys. The instructor and his assistant spend a part of their time each week in the shops where the boys work, to keep in touch with the practical problems. From these practical shop problems they select the lesson material. Spelling is provided from the shop and machine catalogues, blue printing, drawing, designing, problems in arithmetic, applied geometry and algebra are supplied from the shop work in which the boys are engaged. When they meet their instructor in the class-room they find a friend who understands their problems and difficulties, the things that hinder their promotion and depress their wages. The results are indeed remarkable. One would hardly expect that a half day each week in school would be sufficient for great improvement. Perhaps it is not; but it has proven sufficient time for mental awakening; the improvement seems to take care of itself, and, in fact, to proceed at a rate considerably faster than where a full week is given to drill and exercise for improvement. The school is in session forty-eight weeks a year, eight hours a day, and four and one-half days a week, and costs the board of education about fifteen dollars a year per boy. The course of study covers four years and includes

mathematics, reading, writing, spelling, drawing, civics and mechanics. A similar school could be planned for girls who have entered industry. The department stores of Boston have organized classes of this sort for their sales-women. The advantages of this form of continuation school are many; first, perhaps, is the fact that it catches (as Supt. Dyer puts it) the boy in the shop and gets him into school; but hardly less important is the fact that the boys see the practical purpose of everything they study and thus have a real motive for study. There are no questions of discipline in these classes. Attendance is regular, for if the boy is absent he is reported to his employer and docked. Since he is paid for his time attending school it is no sacrifice to the boy. The apparent sacrifice of a half day's time on the part of the employer is really more than returned to the factory in the quickened interest and skill of the boy as well as in the good effect upon foremen; for the success of this plan depends very largely upon the skill with which the teacher makes friends of the foremen. It is a comparatively simple and inexpensive plan to put into operation; and finally, it

need not wait for legislative action, being already sanctioned by the laws of Ohio.

The third suggestion of incorporating industrial education within the secondary schools is no longer merely a possibility, but an actuality. Perhaps most people who have not kept closely in touch with educational progress in Hamilton would be surprised to learn of the development of industrial education in the High School. The course in Manual Training is founded upon, and is practically identical with, the course of the Stuyvesant Manual Training School of New York; the only exception being that the final year of the course in the Hamilton High School is, as yet, in embryo. The first year's work is a thorough course in joinery, including the usual accompanying work in mechanical drawing; shop problems, the use of instruments, blue printing, and an original drawing for the final piece. It should be noted here that the course, including the mechanical drawing, really begins in the sixth year of the elementary schools. The second year's work is wood-turning, pattern-making, elementary forge work and the related problems of mechanical drawing. The

third year is forge work with mechanical perspective and architectural drawing. The fourth year which has been planned, but not yet presented, for lack of equipment and school-room space, will be machine work. It is to be understood that these courses are not offered with a pretension of trade teaching, but are combined with the other High School work to form an adequate basis for any one of half a dozen different trades. The course in domestic economy has the same aim; cooking, sewing, garment cutting, millinery are taught, not as trades, but as part of a liberal as well as a practical education. Many who are in a position to judge attribute a large part of the rapid growth of the High School in the last few years to the popularity of these courses.

The thoroughness of the work already done would seem to make the High School the logical point for the development of further industrial work. The need of a course in agriculture and the hearty support which it would probably receive in the county has been presented, as has the demand for commercial work. Undoubtedly more important than either of these, in its direct bearing upon the lives of many students of the school, would be a course in a properly equipped machine shop. To add these courses or even to maintain those

now started in a manner to accommodate properly the rapidly increasing enrollment of the High School is hardly possible without additional school-room space. At the present rate of increase every available room will be in use next year. A new building or extensive additions to the present one would certainly have to be the first step toward preparing for additional courses. The cost of equipment would be greatest for the machine shop. The equipment for either of the other courses mentioned need not be much more than for any ordinary class-room. A rough estimate of the cost of equipping such a machine shop was placed at five thousand dollars by one of the foreman in a local machine and tool shop. Rouillion¹ in his Economics of Manual Training exhibits in detail an estimate of the cost of equipment for machine shop work and equipment for a course of bench work in chipping and filing, such as is usually combined with the machine shop work. The total estimate for the latter course is five hundred dollars and for the former, supplying individual machine tools, \$5858.68. Each of these is for a class of twenty-four and includes an estimate for the numerous small tools required in machine shop

1: Rouillion Louis. The Economics of Manual Training
122-130.

equipment; but does not include cost of maintenance, depreciation of equipment or power. The fundamental necessities sufficient for a class of twenty-four could certainly be installed at a much lower figure. The cost of instruction in such courses is heavy. These items are apt to loom large in the view of the taxpayer, or of the member of the board of education who feels his responsibility to the taxpayer. But in a city whose great industry is metal working such a course is of inestimable value. A single illustration may serve to emphasize how much larger is the return to the community than the expenditure. The president of one of Hamilton's machine shops whose products are truly "known in the world's markets" stated: "We pay our so-called apprentices \$5 per week the first year, \$7 the next, and \$9 the third year. However, if we can get young men who have had the training of a technical high school or its equivalent we are glad to start them at \$50 per month." He added that his demand for labor could not ordinarily be met by the local supply. If there is a difference of \$30 a month in the wages of the first year, in favor of the boy who has had training in a technical high school,

it would appear that the value of his training during the first year that he uses it is equivalent to \$7200. capitalized at five per cent. per annum. Whether that value appreciates or depreciates there is not enough data to decide. What besides financial benefit he derives from it cannot be determined. But a single graduate of such a course may well be considered, as an investment, worth more than the whole cost of equipment.

It is as important to provide for the girl as for the boy. The present course in domestic economy might easily be enriched and extended to make a complete course in garment cutting and making. Garment making is one of Hamilton's industries which attracts a large per cent. of the girls leaving school before sixteen years of age. There are good opportunities in this business for capable and well trained young women who can act as forewomen and shop instructors. The additional equipment would not be expensive and the cost of maintenance is estimated by Rouillion¹ at but twelve cents per pupil, if each furnish her own garment material.

No doubt other courses in the High School will be

1: Rouillion. The Economics of Manual Training, p.146

demanded before long; and if a new building were provided, such demands would certainly need to be anticipated. The courses suggested should be made cooperative with the industries of the city if possible. When this is done they should be continued more than the thirty-eight weeks of the school year; thus utilizing much more fully an expensive educational plant.

There remains the fourth possibility of incorporating industrial education within the elementary schools. The urgent need of more room for the High School has just been pointed out. The erection of a new building for High School purposes is now being earnestly discussed. If accomplished, the present building which is a very good one and centrally located, might be taken for the seventh and eighth grades of the entire city. The departmental system of instruction or any other high school methods which seem feasible might be introduced, thus partly breaking down the barrier between elementary and secondary education which now seems so insuperable to many boys and girls. The course of study should be made to branch at this point into two divisions, allowing the parents of the children to decide which course shall be

pursued. One course should be adapted to those who feel that they must leave school as soon as the law permits; and while not losing sight of those character-forming studies which have been esteemed by the wise and good of all ages, should eliminate from the more practical studies, arithmetic, geography and drawing, all that cannot stand the test of utility; and finally, these studies and, in fact, the entire curriculum, should be enriched by being brought into vital relations with the life of the community. To turn the face of the child toward the labor which makes his education possible is a form of industrial education suitable for the elementary school. This may be done whether the seventh and eighth grades are housed separately or not. When the children of Hamilton come to the topic of irrigation in geography, what better point of attack than the monster engines made by a local shop for the great pumping stations of the irrigated portions of the West? The arithmetic in use in Hamilton schools is admirable in its elimination of topics historically dead, such as partnership and time, and of others which never had life except in the brain of the arithmetician,-as alligation alternate; but it abounds with many which are equally dead to the

child, because they have never been a part of his own life, and, as usually presented, are not connected with the life of the community. Other topics present great opportunity for enrichment. The subject of insurance in our arithmetic text receive attention in but two pages, with an occasional review problem on subsequent pages. Aside from the actual operations of measurement what topic of arithmetic has more of universal, vital and practical interest today than that of insurance ? True, it is a highly complex subject whose intricacies are calling forth the supreme powers of master minds. But is it not also true that the simpler phases of this subject will confront nearly every young man and women in America not once, but frequently; has very often, in some form, confronted him before he meets it in school ? What an opportunity to lay hold on a real and vital interest of the community and draw from it true culture. Drawing was originally placed in American public schools as a vocational subject to be of practical utility; but it has been transformed into an avocational subject, to be used only in the leisure hours of after life, if used at all. The following is the list of the lessons presented to an eighth grade in 1909-10:

- I. Plant - water color from life.
- II. Plant - reproduction of drawing in book.
- III. Landscape - reproduction from book.
- IV. " " " "
- V. Fir tree - reproducing copy.
- VI. Circle design.
- VII. Lamp-shade.
- VIII. Strip of color values.
- IX. Book cover.
- X. All over surface design.
- XI. Black and white design.
- XII. Color scale.
- XIII. Art glass window - water color.
- XIV. Copy of Japanese drawing in black and white.
- XV. Copy of drawing of still life.

Here is a feasible point of attack for separating the course of study into two lines; one of which would remain as at present,- purely cultural; the alternative should be some such specific training in practical art as the industries of the city demand. This training should aim to contribute directly and strongly to the student's wage-earning ability.

And would it therefore be any less cultural ? Dr. Draper¹ says, "Culture is the refining of the soul through labor and the experience of life." Some years before that definition was published the writer was a member of Prof. Feeny's class at Miami University. Our topic was, "The Teaching of Mathematics." With the instinct of a true teacher the first question put to us was one we were not looking for, "What is culture ? We were seeking culture. We had more or less clearly our individual notions of some of its essential qualities. But we could not bound our ideas. Neither with satisfaction to ourselves nor to each other could we fix the defining limits of that which the word signifies. But in the discussion which this Socratic question gave rise to, skillfully our teacher drove home his point; that however intangible its definition, true culture had but one clearly marked source, namely, contact with life. Culture might be sought in books, in school, in travel or in society, but would only be found in any one of these when they brought us into touch with life.

Industrial education for Hamilton is certainly feasible in the form of a continuation school and of strengthened

1: Draper A.S. The Adaptation of the Schools to Industry and Efficiency. Proceedings of N.E.A. 1908, p. 74

and enlarged high school courses. If it can also be put into the elementary schools by bringing the course of study into closer relation with the life of the community, none need fear the lessening of culture; and the teaching force will be first to feel its beneficial effects. For teachers especially need to keep in touch with their fellowmen and with the myriad problems of life.

Figure 1 Total Enrollment by Ages -
Vermillion Public Schools
1909-10

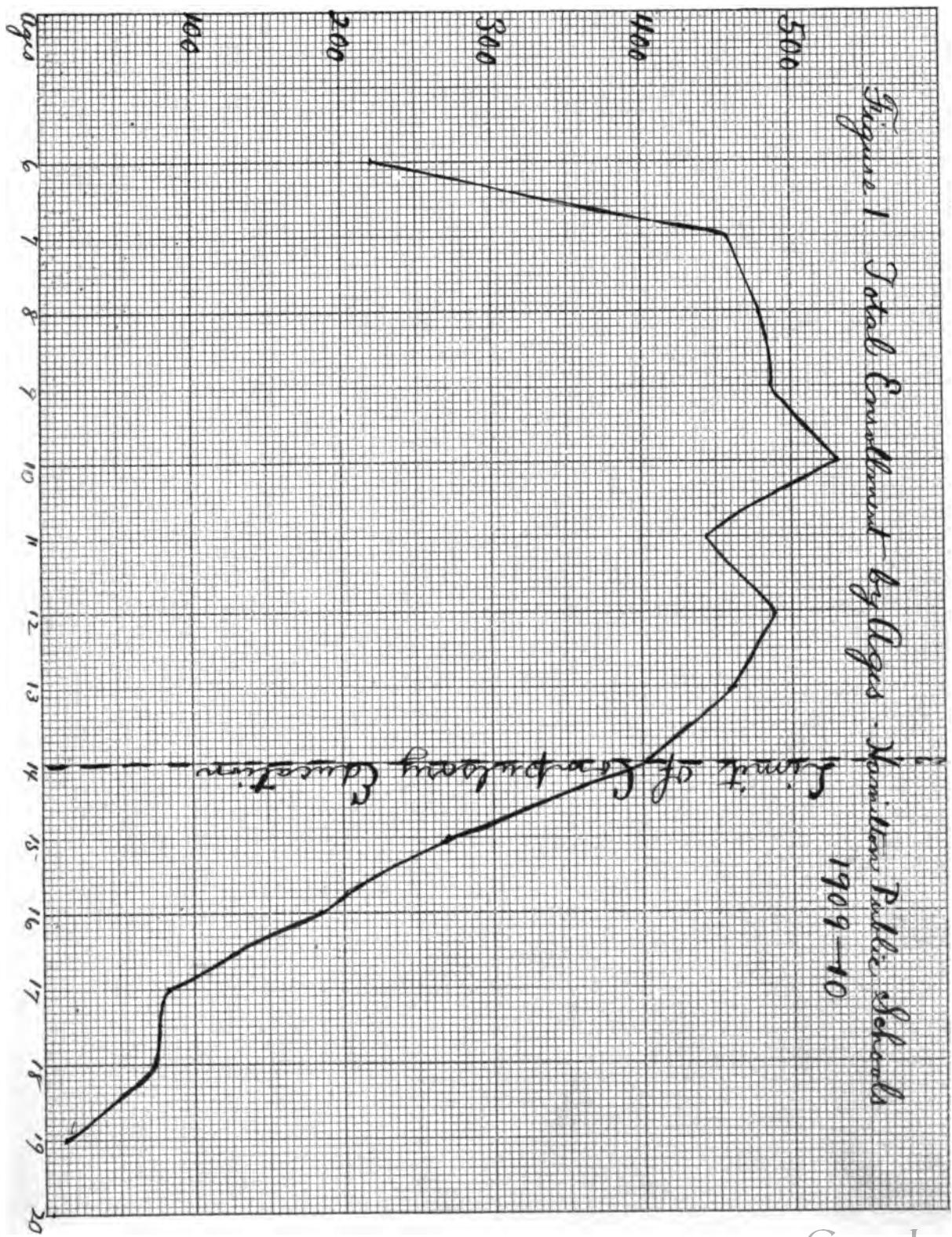
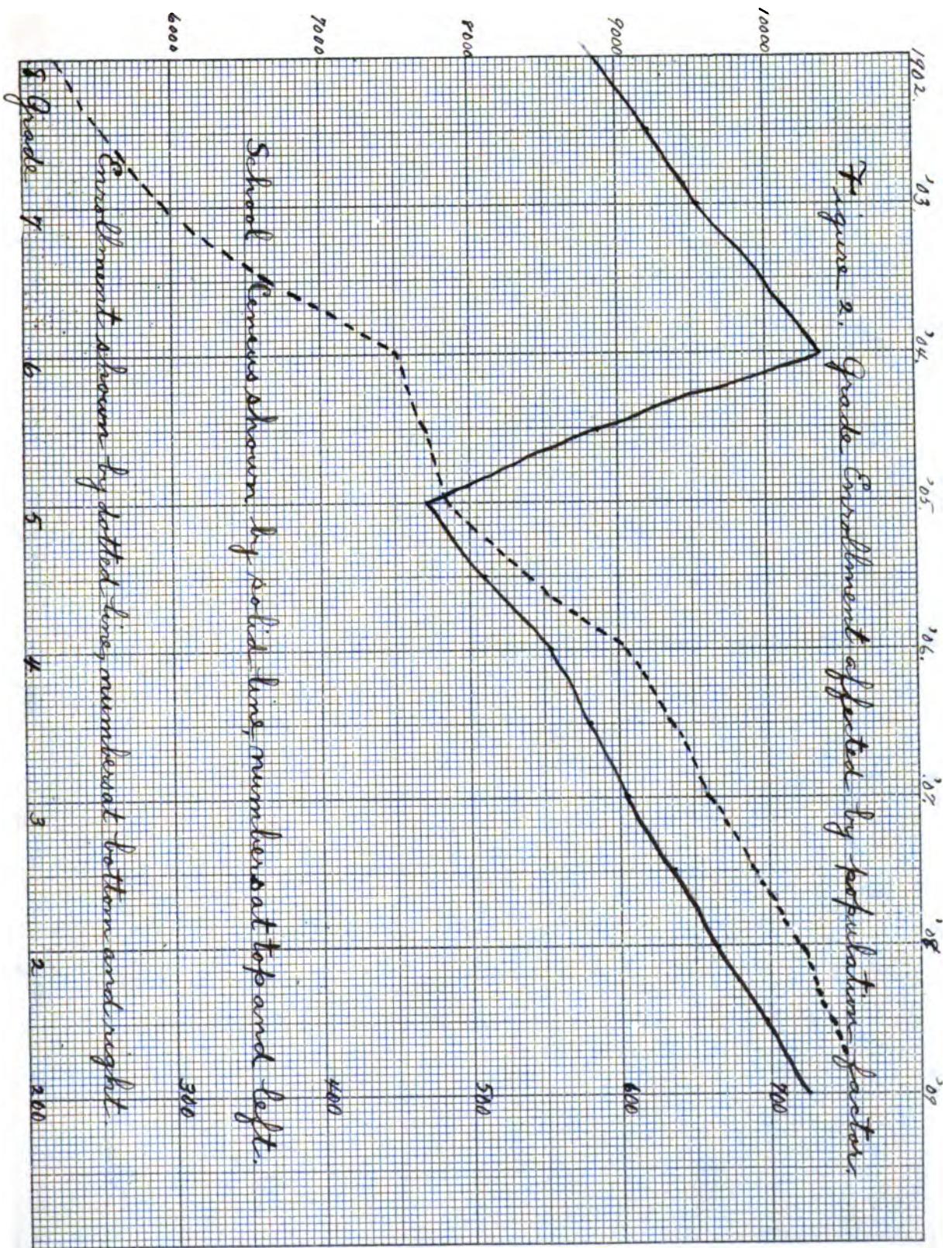


Figure 2. Grade Enrollment affected by population factor.

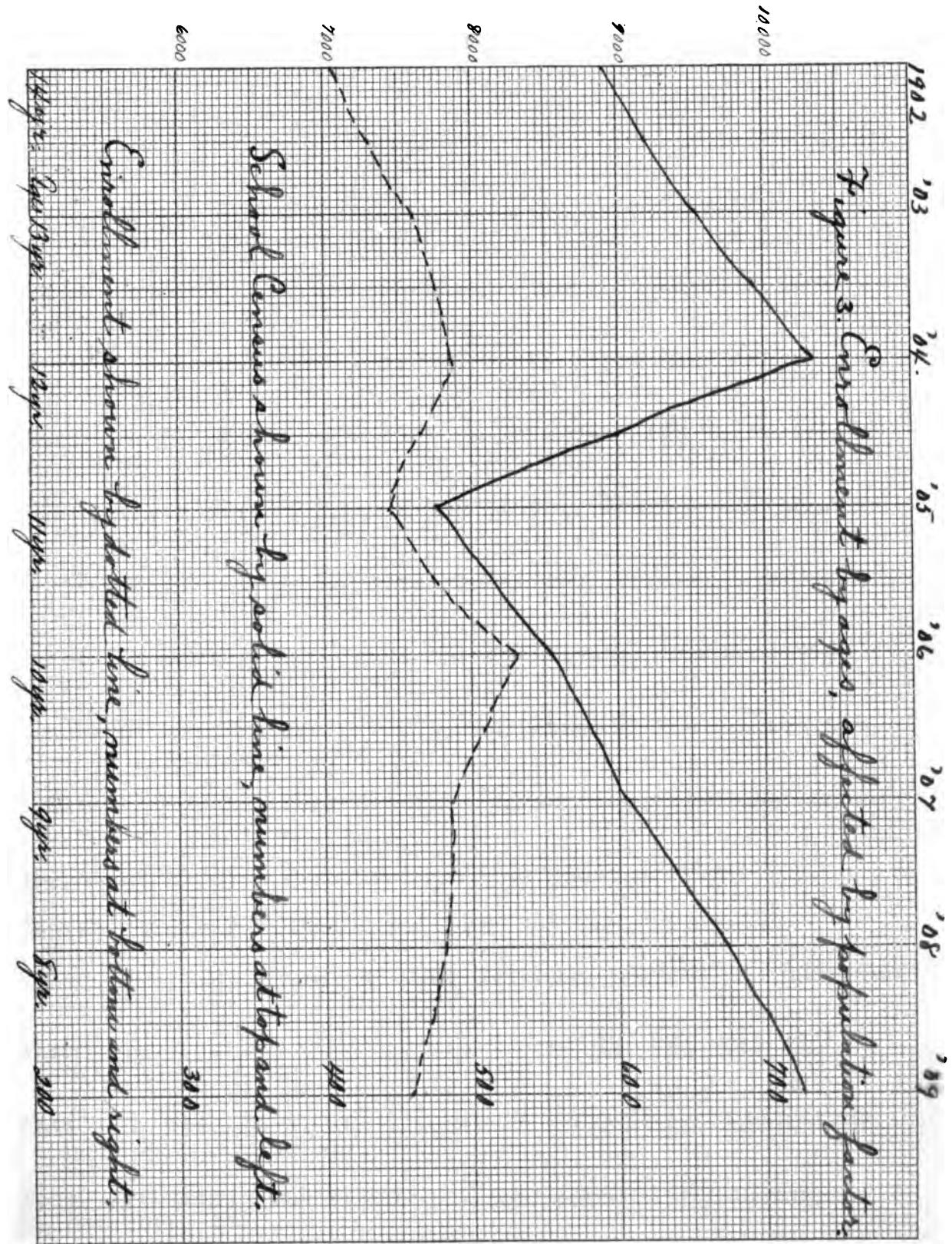


School names shown by solid line, numbers at top and left.

Enrollment shown by dotted line, numbers at bottom and right.

Grade 7 6 5 4 3 2 1

Figures 3. Enrollment by ages, affected by population factor.



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APPROVED

A handwritten signature in cursive ink, appearing to read "S. O. E. Collier". The "S." and "O." are larger and more stylized than the "E." and "Collier".

Professor of Education

July 16th, 1912

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NON-CIRCULATING

**2/8/2008
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